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Accounting for Sustainable Development

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ACCOUNTING FOR SUSTAINABLE DEVELOPMENT

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In 1991, a Harvard economist told a tax policy group that environmental regulations would cost the American economy three percent of real Gross National Product ("GNP") annually by 2005, mainly by consuming capital stock that otherwise could be invested in productive activities.[1] This might be true, but just what would it prove? Certainly it would prove that environmental regulations are costly according to standard measures of economic production. However, it would *not* prove either that environmental regulations are *too* expensive (though they might be) or that they impose *real* losses to economic welfare (though they might).

The problem, simply put, is that GNP and other standard measures of economic production fail to adequately reflect the actual economic-welfare impacts of environmental policies. While they are often taken as proxies for social welfare or quality of life, they are, in fact, nothing of the kind.[2] GNP measures only "transactions that pass through the market," based on total expenditures on final sales of goods and services.[3] It does not incorporate costs and benefits arising outside the market, including many relating to environmental degradation and protection.[4] While

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1. *Better Understanding of Regulations' Cost to Society Needed, Economist Says*, Daily Rep. for Execs. (BNA) (Sept. 13, 1991).

2. *See* JAMES D. GWARTNEY & RICHARD STROUP, ECONOMICS: PRIVATE AND PUBLIC CHOICE 127 (2d ed. 1980).

3. FRANCES CAIRNCROSS, GREEN INC. 98-99 (1995).

4. *See id.* at 99-100.

GNP is very good at measuring short-term performance of the economy, it systematically underestimates (or simply fails to incorporate) the costs to society of pollution damage, the benefits of pollution prevention, the costs associated with depletion of natural resource stocks, and the benefits of resource conservation. To the extent that these environmental costs and benefits are reflected at all in the national income accounts, they tend to be perversely distorted.

First, consider the treatment of pollution in GNP computations. Suppose a factory produces toxic wastes, which it dumps without protection, leading to soil and groundwater contamination. Some people in the neighboring community fall ill as a consequence. Common sense would tell us that those illnesses, and other damages resulting from the toxic wastes, constitute costs to social welfare. However, national income figures largely ignore these costs. GNP will reflect marginal losses in productivity among the affected population, but only to the extent that their illnesses make them less productive. The largest part of the (very real) costs of pollution may have no direct impacts on production, as measured by transactions occurring in the market. Those costs will not, therefore, be reflected in GNP computations.

Even worse, toxic waste dumping is actually likely to cause national income to rise *statistically* by contributing to increased production in a variety of industries, including the industry that dumps (but does not have to pay for) the waste, the health-care industry (which treats the people made ill by the toxic wastes), and the environmental clean-up industry (which will remediate the waste site if someone pays for it). So, as far as the national income statistics are concerned, toxic waste discharges paradoxically provide net economic benefits for society. Of course, these benefits are purely *statistical*; they mask *real* (but excluded) costs to economic welfare. For example, the 1989 Exxon *Valdez* oil spill in Alaska actually increased recorded growth in the American economy;[5] the environmental damages resulting from the spill were not counted against GNP because they fell outside the market, but

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5. *Getting Physical; National-Income Accounts Do Not Properly Value Natural Resources, But Changing That Can Be Difficult*, THE ECONOMIST, Aug. 26, 1989, at 53.

the costs incurred in cleaning-up Prince William Sound *were* market transactions and, therefore, contributed to GNP.[6] This is obviously perverse, as any respectable economist would admit.

The treatment of the natural resource base in national income accounts is equally perverse. When natural resources, including commodities like oil and gas, and non-commodity resources like clean air and water, are consumed in the production process, there are obvious costs to the economy. Some of those costs, particularly those relating to the consumption of commodity resources, are reflected in GNP figures to the extent that producers bear resource extraction costs and pay scarcity prices for resources. But to the extent resources, such as clean air and water, are used without cost to the user, their depletion is *not* reflected in the national income accounts. A 1989 article in *The Economist* summed up the basic problem in this simple, but graphic way:

> Imagine a country that dug up all its coal, burnt down all its forests, killed off all its wildlife, filled its air with smoke and its rivers with dirt. Would that country thus become poorer? Yes, says common sense. No, say national-income accounts.[7]

This is hardly an exaggeration. A group of economists from the World Resources Institute ("WRI") conducted a study of economic growth in Costa Rica between 1970 and 1989.[8] According to conventional measures, the Costa Rican economy grew at an average annual rate of 4.6 percent during that period.[9] However, this growth rate did not include costs related to the depletion of natural resource stocks, including soil fertility, forest resources, and fisheries.[10] In fact, during the period studied, the Costa Rican fishing industry began to collapse, and massive deforestation greatly reduced the country's natural productivity.[11] The WRI economists estimated that Costa Rica's growth rate between 1970

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6. *Id.*

7. *Id.*

8. *See* R. SOLORZANO ET AL., ACCOUNTS OVERDUE: NATURAL RESOURCE DEPRECIATION IN COSTA RICA (1991).

9. *Id.*

10. *Id.*

11. *Id.*

and 1989 would have to be reduced by approximately one-quarter to reflect the declining stock of natural resources.[12]

In a similar study of economic growth in Indonesia between 1971 and 1984, WRI economists found that GNP would fall from seven to four percent, after factoring in the depletion of timber supplies, known oil reserves, and soil productivity.[13] It should be noted that these studies relied exclusively on existing market values for standing timber, known oil reserves, and productive land; no economic sleight-of-hand was involved.[14]

By failing to account for the (real) costs of environmental degradation, national income accounts also make pollution-prevention and resource conservation policies appear more expensive than they actually are. After all, if those policies impose regulatory costs that are reflected in GNP to ameliorate problems whose costs are not reflected in GNP, the policies unavoidably will appear costly to welfare. But, again, those *statistical* losses may mask *real* gains in welfare. If the national income figures were adjusted to more accurately reflect the social benefits from environmental regulation, "the effect . . . on 'true' productivity, would be less negative" than commonly estimated — "or even positive."[15]

The same problem of the failure to account for pollution costs and (regulatory) prevention benefits pervades standard cost-benefit analyses, which increasingly influence policy, particularly in the United States. The costs of environmental regulations are comparatively easy to estimate; they are mostly born by market-participants (industry and consumers), and thus are commonly denominated in dollars. The benefits of environmental regulations, however, which include breathing cleaner air and water, are not easily converted into dollar signs. Consequently, cost-benefit analyses tend to be biased against regulatory policies aimed at

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12. *Id.*

13. This study is discussed in J. Walter Milon, *Environmental and Natural Resources in National Economic Accounts*, *in* INTEGRATING ECONOMIC AND ECOLOGICAL INDICATORS 131, 138 (J. Walter Milon & Jason F. Shogren eds., 1995).

14. *Id.*

15. Robert H. Haveman & Gregory B. Christiansen, *Environmental Regulations and Productivity Growth*, *in* ENVIRONMENTAL REGULATION AND THE U.S. ECONOMY 55, 75 (Henry M. Peskin et al., eds., 1981).

pollution prevention and resource conservation. The only way to remove that bias is to adjust the analyses to better reflect the actual (though difficult to quantify) welfare benefits of regulation.

The argument is not, however, that cost-benefit analysis or conventional measures of economic production should be scrapped. They are useful, even imperative, tools of economic and policy analysis. It would be morally questionable to ignore the costs and benefits of policy alternatives in circumstances where problems are many and funds are limited. Moreover, the information provided by national income statistics has some (limited) relevance for environmental protection. Conventional national income measures can predict and explain, to some extent, the level of political commitment to environmental protection. A recent article by economists Gene M. Grossman and Alan B. Krueger found that "economic growth brings an initial phase of deterioration followed by a subsequent phase of improvement."[16] The turning point occurs at approximately $8000 per capita GNP.

While GNP computations and cost-benefit analyses are useful, perhaps even indispensable, tools of policy analysis, they should be modified to better, more realistically, account for pollution costs and regulatory benefits. This is hardly a new claim, though it remains somewhat controversial. Economists have long understood the limitations of the current system of national accounts. But the issue gains increased significance with the emergence of the "Cost-Benefit State,"[17] in which cost-benefit analyses are becoming virtual decision rules for policy making. Without better accounting for (non-market) environmental costs and benefits, the Cost-Benefit State will be biased against pollution prevention and resource conservation; it will continue to paint rosy *statistical* pictures of the economy, even if *real* welfare deteriorates.

The task, then, as we approach the twenty-first century is to devise workable criteria and methods for refining cost-benefit analysis (on the micro-level) and national income accounting (on the macro-level), to more accurately assess the real environmental

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16. Gene M. Grossman & Alan B. Krueger, *Economic Growth and the Environment*, 110 QUART. J. ECON. 353, 369 (1995).

17. *See* Cass R. Sunstein, *Congress, Constitutional Moments, and the Cost-Benefit State*, 48 STAN. L. REV. 247 (1996).

costs of pollution and resource consumption and corresponding benefits from pollution prevention and resource conservation. However, this is more easily said than done. Economists have been working at it since at least the mid-1940s, when Sir John Hicks, a Nobel Prize-winning economist from Britain, showed that the most relevant indicator of economic welfare is not Gross National Product, but *net* income, defined as the amount a country can consume without depleting its capital stock.[18] If "capital stock" is defined to include all natural resources used in or affected by production, then Hicks's definition of "income" could also serve to define the concept of "sustainable development." However, to date economists have had little success designing workable adjustments to national income calculations. One early effort by James Tobin and William Nordhaus attempted to refine GNP by: (1) subtracting pollution costs, (2) excluding "regrettable necessities," such as police protection, national defense, and possibly some costs of environmental regulation, and (3) adding in the estimated value of certain nonmarket goods, such as household productive activities and leisure.[19] Nordhaus and Tobin labelled their accounting device "Measure of Economic Welfare" or "MEW".[20] But, like more recent efforts to amend the system of national accounts, their proposal was plagued by a fundamental problem: they could not provide an "objective" (*i.e.*, non-controversial) method for valuing nonmarket goods and bads.

This valuation problem is the greatest hurdle facing those who would turn the national income accounts into more realistic measures of sustainable development and efforts to reduce the anti-regulatory bias of cost-benefit analyses. Many nonmarket measuring tools have been offered as solutions to the valuation problem, including contingent valuation, the travel-cost method, hedonic pricing, and existence valuation.[21] But they all remain controversial. The contingent valuation method, for example, asks people

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18. *See* J. R. HICKS, VALUE AND CAPITAL (2d ed. 1946).

19. *See* William Nordhaus & James Tobin, *Is Economic Growth Obsolete?*, *in* 5 ECONOMIC GROWTH, FIFTIETH ANNIVERSARY COLLOQUIUM 1, 4 (1972).

20. *Id.*

21. For brief descriptions of these different valuation methods and their problems, see V. Kerry Smith, *Nonmarket Valuation of Environmental Resources: An Interpretive Appraisal*, 59 LAND ECON. 1 (1993).

how much they would pay to protect an environmental amenity or, conversely, how much they would accept to allow it to be destroyed or taken away.[22] The problem with this approach is that surveyed individuals are not forced to put their money where their stated preferences are; consequently, they have no incentive to avoid over- or under-estimating their individual valuations of nonmarket goods and bads.[23]

The travel-cost method avoids the valuation problem by measuring only how much people actually spend getting to and from environmental amenities, such as national parks.[24] However, the costs actually incurred may constitute only a fraction of the total value of national parks and other environmental resources.

Another potential alternative to the sticky problem of valuing nonmarket goods and bads is to convert them to market goods and bads through commodification and privatization. According to "free market environmentalists," defining property rights in natural resources such as air and water would bring virtually all the costs and benefits related to their use (and conservation) within markets, where dollar values would be attached.[25] This would eviscerate the valuation problem, so that cost-benefit analyses and standard measures of national income could capture *all* the costs and benefits of activities relating to the environment.[26]

This, however, is not a solution. It simply trades one set of problems for another. The valuation problem is exchanged for the even more difficult (if not impossible) problem of drawing clear and defensible boundaries in resources such as the atmosphere. In addition, the process of privatization would likely entail high transaction costs. After all, the process would create winners (those who get entitlements) and losers (those who do not), and there is every reason to expect that interested parties would lobby, before the fact of privatization, for the allocation scheme that

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22. *Id.*

23. *See* Brian R. Binger et al., *The Use of Contingent Valuation Methodology in Natural Resource Damage Assessments: Legal Fact and Economic Fiction*, 89 NW. UNIV. L. REV. 1029 (1995).

24. Smith, *supra* note 21, at 3.

25. *See generally*, TERRY L. ANDERSON & DONALD R. LEAL, FREE MARKET ENVIRONMENTALISM (1991).

26. *Id.*

would bring the most benefits their way.[27] So, even if privatization of *all* environmental amenities were plausible (which it is not), it is at least possible that the high costs of privatization might exceed its expected benefits.

A third approach to the problem of valuing environmental amenities is to recognize simply that environmental values are incommensurable with economic values.[28] This approach may actually be the most realistic, given the current state of economic science. Rather than solving the problem, though, it simply gives up on it. It does not even try to provide an acceptable method for determining how (and how much) nonmarket costs and benefits should be considered in economic policy making. After admitting the incommensurability of environmental values, what hope is there for deriving an objective means of incorporating those values into economic decision-making and policy-making concerning (or affecting) the environment?

As the twenty-first century approaches, it remains unclear whether nonmarket values can be successfully incorporated into GNP and other measures of production. One promising sign, at least, is that governments and nongovernmental organizations around the world have been taking the problem seriously and working on it diligently. Rather than directly modifying existing national income accounts, most governments have focused on developing separate "satellite" accounts, which measure the stock of natural resources, sometimes in non-monetary units, such as acres or hectares.[29] But efforts to keep separate economic and environmental indicators seem vain, as policy makers ultimately are bound to confront problems of deriving common denominators.

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27. *See* Chulho Jung et al., *The Coase Theorem in a Rent-Seeking Society*, 15 INT'L REV. L. & ECON. 259, 260-62 (1995).

28. *See* Cass R. Sunstein, *Endogenous Preferences, Environmental Law*, 22 J. LEGAL STUD. 217 (1993).

29. This is the approach recommended by the United Nations. *See* U. N. DEP'T FOR ECONOMIC & SOCIAL INFORMATION & POLICY ANALYSIS, STATISTICAL DIVISION, HANDBOOK OF NATIONAL ACCOUNTING: INTEGRATED ENVIRONMENTAL AND ECONOMIC ACCOUNTING, U. N. Doc. ST/ESA/STAT/SER.F/61, U. N. Sales No. E.93.XVII.12 (1993).

Some countries, including Poland and Japan, have taken a more forthright approach to the problem, directly offsetting nonmarket environmental costs against Gross Domestic Product ("Green GDP"). Polish economists first began studying the economic costs of environmental degradation in the mid-1980s, when Poland suffered "a combined economic and ecological crisis of immense proportions."[30] After subtracting "reasonably ascertainable" environmental costs (including increased health-care expenses, lost work hours, depletion of natural resource stocks, etc.), they found that pollution and resource waste were costing the national economy between ten and twenty percent of GDP each year.[31] These studies were unofficial — Poland has no official Green GDP index — but they spurred the Polish government to increase environmental *investments* (for instance, in sewage treatment plants) to reduce the economic burdens from environmental degradation.[32]

In June 1995, Japan's Economic Planning Agency issued its first Green GDP assessment.[33] The assessment concluded that environmental degradation from air pollution, water pollution, and ecosystem damage cost the Japanese economy 8.4 trillion yen (100 billion USD) or two percent of GDP in 1990.[34] According to officials from the Economic Planning Agency, who acknowledged that Green GDP had to be "made more sophisticated to reflect environmental losses more accurately," these cost estimates were conservative.[35] Indeed, the agency plans in future Green GDP computations to include domestic and international costs related to emissions of carbon dioxide, chlorofluorocarbons, methane gas, and nitrogen oxides.[36]

Of course, Japan's Green GDP and similar efforts in other countries are in their infancy. It will be a long time before they

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30. Daniel H. Cole, *Poland's Progress: Environmental Protection in a Period of Transition*, 2 PARKER SCH. J. E. EUR. L. 279, 279 (1995).

31. *Id.* at 301.

32. *Id.* at 300-02.

33. *Japan, Environmental Damage Index Shows Decline According to "Green GDP,"* Int'l Env't Daily (BNA) (July 13, 1995).

34. *Id.*

35. *Id.*

36. *Id.*

are sufficiently sophisticated to serve as reliable measures of social welfare. However, they hold the potential for a more rational and realistic system of national income accounting. And they ultimately will determine whether "sustainable development" is a meaningful concept or just a vacuous slogan.